

REMARKS/ARGUMENTS

The present Amendment and Response comprises Applicants' reply to the Examiner's March 8, 2010 Non-Final Office Action. Claims 13, 16 and 17 are cancelled. Claims 1, 2, 18, 29, 31 and 34. are amended. Claims 4-12, 14-15, 20-23, 32 and 35 are withdrawn; of those, Claims 11, 14, 15, 22, 32, and 35 and withdrawn and currently amended. Accordingly, Claims 1-12, 14, 15 and 18-35 are now pending in view of the above amendments.

As noted, Claims 11, 14, 15, 22, 32, and 35 were previously withdrawn but are now currently amended. Applicants believe that Claims 11, 14, 15, 22, 32, and 35 may rejoined in light of Applicants arguments below and the current amendment to these claims.

Applicants believe that no new matter has been added with regard to the claim amendments provided herein. Applicants do not donate or disclaim any claims or subject matter with the claim amendments made herein, and the Applicants expressly reserve the right to prosecute the original claims or any unclaimed subject matter in one or more future filed continuing applications.

Reconsideration of the application is respectfully requested in view of the above amendments to the claims and the following remarks. Please note that the following remarks are not intended to be an exhaustive enumeration of the distinctions between any cited references and the claimed invention. Rather, the distinctions identified and discussed below are presented solely by way of example to illustrate some of the differences between the claimed invention and the cited references. In addition, the Applicants requests that the Examiner carefully review any references discussed below to ensure that Applicants' understanding and discussion of the

references, if any, is consistent with the Examiner's understanding. Also, Applicants' arguments related to each cited reference are not an admission that the cited references are, in fact, prior art.

I. Rejection under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected Claims 28 and 30-31 under 35 U.S.C. § 112, Second Paragraph as not distinctly claiming the subject matter of the invention. The Examiner rejected Claims 2, 13, 18, 31, and 34 under 35 U.S.C. § 112, Second Paragraph as indefinite because it was unclear whether the limitations included in the parentheses are part of the claimed invention. The Examiner rejected Claims 28 and 30 U.S.C. § 112, Second Paragraph as having improper antecedent basis.

Applicants have amended Claims 2, 13, 18, 28, 30, 31, 34, and 35 to correct the formality issues brought to attention by the Examiner. Applicants respectfully point out that currently withdrawn Claim 35 was amended to correct a typographical error of composition $\text{BaSr}_x\text{Ti}_{1-x}\text{O}_3$, and assert all amendments made to these claims are supported by the specification. Applicants request that the Examiner remove these rejections.

II. PRIOR ART REJECTIONS

B. Rejection under 35 U.S.C. § 102

The Examiner rejected Claims 1-3, 13-14, 18-19, 24-31, and 33-34 under 35 U.S.C. § 102 as being anticipated by Publication No. WO 2003/031323 to Korea Nano Technology Co., Ltd. ("WO '323"). Examiner stated that WO '323 teaches:

a method of producing metal oxide and magnetic nanoparticles comprising adding a precursor or precursors to a solvent and surfactant, heating the solution at 30-500°C in order to obtain nanoparticles, and separating the produced nanoparticles;

the compounds listed including compounds of iron and nitrate;

compounds of organic acids including oleic acid;

solvents including ethers (such as octyl ether), organic acids (which are described as surfactants but are also considered solvents), and hydrocarbons;

a molar ratio of precursor to surfactant of 1:0.1 - 1:100 (the surfactant is 0.1-100 times the amount of precursor;

specific examples with the amount of solvent is in the range specified by the claims;

reacting times of 1 minute to 24 hours and temperatures of 50-500°C and specific examples with reaction times in the range of the claims;

that the size of the nanoparticles can be controlled by varying the precursor to surfactant ratio; and

single component metal oxide (magnetic) nanoparticles including Fe_xO_y.

It is well recognized that claims are anticipated if, and only if, each and every element, as set forth in the claim is found in a single prior art reference. Vertegaal Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631 (Fed. Cir. 1987). Furthermore, “[t]he identical invention must be shown as a complete detail as contained in the . . . claim.” Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1989). See MPEP § 2131. To constitute anticipation, all material elements of the claim must be found in one prior art source. In re Marshall, 198 U.S.P.Q. 344 (C.C.P.A. 1978). Additionally, the elements of the reference must be arranged as required by the claim. In re Bond, 15 U.S.P.Q. 2d 1566 (Fed. Cir. 1999). Applicants respectfully submit that the cited reference does not teach all the materials elements and do not arrange the elements as required by the rejected claim language and traverse the Examiner’s rejections for at least the following reasons:

Applicants traverse these rejections and respectfully argue that WO '323 discloses a method for producing metal or metal alloy nanoparticles comprising the following steps:

- a) addition of a metal precursor to a solvent containing surfactant and
- b) thermal decomposition of said metal-surfactant complexes at 50-500 °C.

The differences between WO '323 can be seen in the following table.

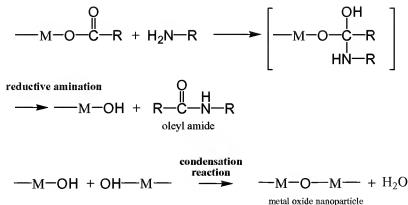
Present Application	WO '323
Addition of a magnetic or metal precursor to a <i>surfactant comprising a mixture of organic acid(C_nCOOH, C_n:hydrocarbon, 7≤n≤30) and organic amine(C_nNH₂, C_n:hydrocarbon, 7≤n≤30)</i> or solvent containing surfactant to produce the mixed solution	Addition of a metal precursor to a solvent containing <i>surfactant</i> and formation of metal-surfactant complexes
Heating of the mixed solution to 50-600 °C for the decomposition of the magnetic or metal precursor and formation of magnetic or <i>metal oxide nanoparticles</i>	Thermal decomposition of said metal-surfactant complexes at 50-500 °C for the formation of <i>metal or metal alloy nanoparticles</i>
Separation of the <i>magnetic or metal oxide</i> nanoparticles	Separation of the <i>metal or metal alloy</i> nanoparticles

The product of WO '323 is metal nanoparticle and needs an oxidant to synthesize metal oxide, whereas the present application discloses directly leading to metal oxide. The present invention can produce metal oxide using a reduced process than WO '323. In addition, the present application discloses the use of a mixture of organic acid(C_nCOOH, C_n:hydrocarbon, 7≤n≤30) and organic amine(C_nNH₂, C_n:hydrocarbon, 7≤n≤30) as a surfactant. WO '323 does not disclose the above surfactant which is a mixture of organic acid and organic amine. WO '323 discloses the use of oleic acid as a surfactant. In other embodiments of WO '323, lauric acid is used. The present application does not disclose a surfactant used as a mixture of organic acid and organic amine. Moreover, Claim 5 of WO '323, which discloses surfactants, along with

the whole description of WO '323, does not disclose, teach, or even suggest the surfactant used in the mixture of organic acid and organic amine. WO '323 also does not disclose that the organic acid is $C_n\text{COOH}$ (C_n :hydrocarbon, $7 \leq n \leq 30$) or that the organic amine is $C_n\text{NH}_2$ (C_n :hydrocarbon, $7 \leq n \leq 30$). Further, WO '323 does not disclose the surfactant used in the mixture of organic acid ($C_n\text{COOH}$, C_n :hydrocarbon, $7 \leq n \leq 30$) and organic amine ($C_n\text{NH}_2$, C_n :hydrocarbon, $7 \leq n \leq 30$) and also does not disclose a method for the direct synthesis of metal oxide nanoparticles using a mixture of organic acid ($C_n\text{COOH}$, C_n :hydrocarbon, $7 \leq n \leq 30$) and organic amine ($C_n\text{NH}_2$, C_n :hydrocarbon, $7 \leq n \leq 30$) as surfactant.

Applicants also concurrently submit a Supplement Information Disclosure Statement with including, among others, a reference which provides additional data submitted during the prosecution of Korea Application No 10-2004-0091240 ("KIPIO Prosecution Reference"), which serves as a basis of priority and is now registered as Korea Patent No. 10-0604975.

The KIPIO Prosecution References discloses one of the mechanisms of the present application as follows:



MCl (metal precursor) reacts with RCOOH (oleic acid) to form $\text{---M---O---C(O)---R}$, followed by reaction with RNH_2 (oleyl amine) to form $\text{---M---O---C(OH)(H---NR)---R}$. Through reductive

amination and thermal decomposition, $-M-O-C(OH)(H-NR)R$ forms $-M-OH$ and oleyl amide after which $-M-OH$ is condensed into metal oxide nanoparticles. Therefore, using a mixture of organic acid(C_nCOOH , C_n :hydrocarbon, $7 \leq n \leq 30$) and organic amine(C_nNH_2 , C_n :hydrocarbon, $7 \leq n \leq 30$) as surfactant, uniform magnetic or metal oxide nanoparticles of a particular size can be synthesized by the above mechanism of the present application.

Simply put, WO '323 does not disclose surfactant as a mixture of organic acid(C_nCOOH , C_n :hydrocarbon, $7 \leq n \leq 30$) and organic amine(C_nNH_2 , C_n :hydrocarbon, $7 \leq n \leq 30$). Moreover, the present application discloses synthesizing magnetic or metal oxide nanoparticles without an oxidant by using a surfactant as a mixture of organic acid (C_nCOOH , C_n :hydrocarbon, $7 \leq n \leq 30$) and organic amine(C_nNH_2 , C_n :hydrocarbon, $7 \leq n \leq 30$). Accordingly, WO '323 does not anticipate the present application. Applicants respectfully request that these rejections against Claims 1-3, 13-14, 18-19, 24-31, and 33-34 be withdrawn.

CONCLUSION

In view of the foregoing, Applicants believe the claims as amended are in allowable form. In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, or which may be overcome by an Examiner's Amendment, the Examiner is requested to contact the undersigned attorney.

Applicants believe no fees are due for this submission. However, please credit any over payment or debit any under payment to Deposit Account No. 08-2665.

Respectfully submitted,

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